

WHAT IS CLAIMED IS:

1 1. A nonaqueous electrolyte secondary battery comprising a
2 positive electrode including a positive electrode active material,
3 a negative electrode including a carbon material as a negative
4 electrode active material and a nonaqueous electrolyte including a
5 solvent and a solute, wherein sulfolane is contained as a solvent
6 in the nonaqueous electrolyte and vinyl ethylene carbonate and
7 vinylene carbonate or a derivative of vinylene carbonate are added
8 to the nonaqueous electrolyte.

1 2. The nonaqueous electrolyte secondary battery according to
2 claim 1, wherein sulfolane is contained in an amount of at least 15
3 % by volume, on the basis of the total volume of the solvent.

1 3. The nonaqueous electrolyte secondary battery according to
2 claim 1, wherein the amount of vinyl ethylene carbonate added to
3 the nonaqueous electrolyte is in a range of 0.1 ~ 5 parts by weight
4 per 100 parts by weight of the nonaqueous electrolyte.

1 4. The nonaqueous electrolyte secondary battery according to
2 claim 2, wherein the amount of vinyl ethylene carbonate added to
3 the nonaqueous electrolyte is in a range of 0.1 ~ 5 parts by weight
4 per 100 parts by weight of the nonaqueous electrolyte.

1 5. The nonaqueous electrolyte secondary battery according to
2 claim 1, wherein the amount of vinylene carbonate or a derivative
3 thereof added to the nonaqueous electrolyte is in a range of 0.1 ~
4 5 parts by weight per 100 parts by weight of the nonaqueous
5 electrolyte.

1 6. The nonaqueous electrolyte secondary battery according to
2 claim 2, wherein the amount of vinylene carbonate or a derivative
3 thereof added to the nonaqueous electrolyte is in a range of 0.1 ~
4 5 parts by weight per 100 parts by weight of the nonaqueous
5 electrolyte.

1 7. The nonaqueous electrolyte secondary battery according to
2 claim 3, wherein the amount of vinylene carbonate or a derivative
3 thereof added to the nonaqueous electrolyte is in a range of 0.1 ~
4 5 parts by weight per 100 parts by weight of the nonaqueous
5 electrolyte.

1 8. The nonaqueous electrolyte secondary battery according to
2 claim 4, wherein the amount of vinylene carbonate or a derivative
3 thereof added to the nonaqueous electrolyte is in a range of 0.1 ~
4 5 parts by weight per 100 parts by weight of the nonaqueous
5 electrolyte.

1 9. The nonaqueous electrolyte secondary battery according to
2 claim 1, wherein the nonaqueous electrolyte contains γ -
3 butyrolactone and sulfolane as the main solvents.

1 10. The nonaqueous electrolyte secondary battery according to
2 claim 2, wherein the nonaqueous electrolyte contains γ -
3 butyrolactone and sulfolane as the main solvents.

1 11. The nonaqueous electrolyte secondary battery according to
2 claim 3, wherein the nonaqueous electrolyte contains γ -
3 butyrolactone and sulfolane as the main solvents.

1 12. The nonaqueous electrolyte secondary battery according to
2 claim 4, wherein the nonaqueous electrolyte contains γ -
3 butyrolactone and sulfolane as the main solvents.

1 13. The nonaqueous electrolyte secondary battery according to
2 claim 5, wherein the nonaqueous electrolyte contains γ -
3 butyrolactone and sulfolane as the main solvents.

1 14. The nonaqueous electrolyte secondary battery according to
2 claim 6, wherein the nonaqueous electrolyte contains γ -
3 butyrolactone and sulfolane as the main solvents.

1 15. The nonaqueous electrolyte secondary battery according to
2 claim 7, wherein the nonaqueous electrolyte contains γ -
3 butyrolactone and sulfolane as the main solvents.

1 16. The nonaqueous electrolyte secondary battery according to
2 claim 8, wherein the nonaqueous electrolyte contains γ -
3 butyrolactone and sulfolane as the main solvents.

1 17. The nonaqueous electrolyte secondary battery according to
2 claim 1, wherein the carbon material has a ratio (I_D/I_G) of a Raman
3 spectrum intensity (R) obtained by Raman spectroscopy of 0.2 or
4 greater.

1 18. The nonaqueous electrolyte secondary battery according to
2 claim 2, wherein the carbon material has a ratio (I_D/I_G) of a Raman
3 spectrum intensity (R) obtained by Raman spectroscopy of 0.2 or
4 greater.

1 19. The nonaqueous electrolyte secondary battery according to
2 claim 3, wherein the carbon material has a ratio (I_D/I_G) of a Raman
3 spectrum intensity (R) obtained by Raman spectroscopy of 0.2 or
4 greater.

1 20. The nonaqueous electrolyte secondary battery according to
2 claim 5, wherein the carbon material has a ratio (I_D/I_G) of a Raman
3 spectrum intensity (R) obtained by Raman spectroscopy of 0.2 or
4 greater.